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* Difference btw mitosis in animal and plant cell

Mitosis in animal cells	Mitosis in plant cells
1 Cytokinesis is happens by furrow. A groove forms in the middle and pinches the cell into two	Cytokinesis is happen by cell plate. A flat plate forms in the middle and grows outward.
2 Asters are present (star like structure near centriole)	Asters are Absent
3 Spindle fibres are made using centriole and aster	spindle fibres are made using only microtubules.
4 Happens in almost all body parts for growth and repair	Happens in growing parts like roots and shoots

* Significance (function) of Mitosis
- somatic growth : increase the no. of cells, growth of body
- Maintains the normal chromosome number
- Check the over sizing of the cell
- Reproduction
- Repairing and wound healing
- Regeneration: of lost body part.

* C.G of Irregular lamina

Ans found by suspending the lamina from different points and drawing vertical lines (using a plumb line). The Intersection of these lines is the centre of gravity.

* Uniform circular motion

• Definition

Ans • Motion of an object moving in a circular path with constant speed.

• Even though the speed is constant, the object is accelerating because its direction changes continously.

• Ex

A car moving around a circular track at a steady speed, or a stone tied to a string being whirled in a circle.

* Comparision b/w uniform circular and linear motion

	linear	circular
*	Speed remain constant	speed remain constant
*	velocity	

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- Dynamic

Ans A state where a body is moving with constant velocity in a straight line, and the net force acting on it is zero

Ex - A car moving with a contant speed on road
- Airplane flying at constant speed.

* Centre of Gravity

- Definition - The point where the entire weight of the body appears to act. for a body in uniform gravitational field.

- Centre of gravity of some Homogenous Regular Shaped Bodies

* circular ring - centre of the ring
* circular disc - Geometric centre of the disc
* Triangular lamina - Point of intersection of median
* Parralelogram, rectangle square and rombus - Point of intersection of diagno
- intersection of diagonal
Solid or hallow sphere - centre of the sphere
Solid or hallow cylinder - Mid-point of the axis of cylind
Solid cone - h/4 from the base
Hallow cone - h/3 from the base
Cube/cuboid - Mid point of the line joining th centres of opposite sides.

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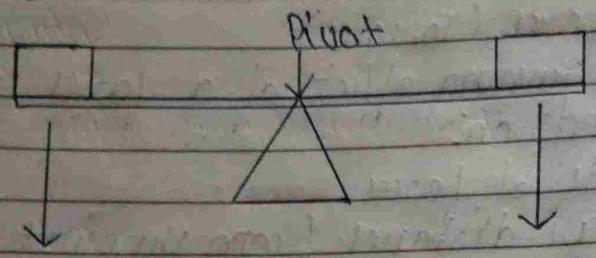
* forces of equilibrium

Ans forces of equilibrium are a set of forces acting on an object where the net forces or resultant force is zero



force acting downward from both side resulting net force zero

* Condition for Equilibrium

a Translational

ns The net force acting on a body is zero (sum of forces in all direction = 0.

b Rotational

ns The net moment about any pivot point is zero (A.C.M = C.M

* Principle of moment

According to the principle of moment the sum of A.C.M = Sum of C.M

* Types of equilibrium

o Static

When a body remain at rest and does not move under the influence of multiple forces

Ex - A book lying on the table

- A boy sitting on a chair

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* Example - When you push a door, the door rotates about its hinges (rotational motions), but if you push a box across the floor, it slides (translational motion).

* Moment of a force (Torque)

Ans Definition = The turning effect of a force, also called torque. It depends on:

- The magnitude of force
- The perpendicular distance from the pivot (axis of rotation) to the line of action of the force.

$t = f \times d$

S.I unit - N.m

C.G.S - dyne.cm

* Clockwise moment - force cause rotation in the clockwise direction (it is negative)
* Anticlockwise moment - force cause rotation in anticlockwise direction (it is positive)

* Example of Torque

- Using a wrench - Applying force to the end of a wrench creates a moment of force the rotates the bolt or nut
- See-saw - Applying force to one end of the see-saw creates a moment of force that rotates it about the ful
- Opening a door - Pushing or pulling the door handle creates a moment of force that rotates the doo around its hinges

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* Resultant force

Ans
- When multiple force act on a body at the same time, the net force acting is called the resultant force.
- if force act in the same direction
  Resultant force = sum of all force
- if force act in opposite direction.
  Resultant = Difference (larger - smaller) in the direction of the larger force.

* Balanced force

ns
- Two or more forces acting on an object cancel each other out
- No change in motion
- object remains at rest or continues moving at constant speed.

* Unbalanced force

ns
- Net A situation where net force is not zero(0) is called unbalanced force
- Changes the state of motion or direction

* Translational Motion

Ans Motion in a straigh line where all part of a body moves the same distance in the same direction (e.g- car moving forward)

* Rotational Motion

Motion where a body rotates about an axis, and different parts move different distance depending their distance from the axis (eg. a spining wheel

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Ch-1 force

- Moment of force and equilibrium

* What is force.

Ans force is a push or a pull acting on a body which can change its state of rest or motion, shape or size

* $f = m \times a$
* C.G.S = dyne
* SI unit = N
* 10^5 dyne = 1 N

* Define 1 Newton.

Ans force needed to accelerate 1kg of mass by $1 m/s^2$

* Example of force

Ans: Kicking a football (starts moving → speed change
- Bending a rubber band (shape changes

* Effect of force

Ans.
- change the speed of an object
- change the direction of motion
- change the shape or size of an object

* Types of force

Ans.
- Contact force i.e normal reaction force, frictional force and Tension force
- Noncontact force i.e Gravitational force, electrostatic force and Magnetic force

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* Difference btw mitosis and meosis

features	Mitosis	Meosis
Occurance	Somatic (body) cells	Reproductive (sex) cells
No of division	One division	Two division
Daughter cells	Two identical diploid (2n)	four non-Identical haploid (n)
Crossing over	Does not occus	occurs causing genetic variation
Purpose	Growth repair asexual reproduction	Gamete formation genetic variation

* What is chromosome

Ans A chromosome is a thread like structure in the nucleus that contains genetic information in the form of DNA. It is made of chromatin, which condense during cell division

* components

- Chromatids: Two identical halves of a replicated chromosome, joined at the centromere.
- Centromere: The region where chromatids are attach spindle fibres bind during division
- Genes: DNA segment that contains genetic information
- Chromatin: The material (DNA and protien) forming chrom -omes.

Ch-1 Force

- Moment of force and equilibrium

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* Miosis

- Difination: A type of cell division that reduces the chromosome number by half, producing four daughter cells (gametes or spores)

- Occurance: In reproductive cells (eg. testes)

- Key feature:
* Involves two division
* Result in four non-identical haploid cells
* Includes crossing over (exchange of genetic material btw homologous chromosome) leading to genetic variation.

- Significance
* Produce gametes for sexual reproduction
* Maintain chromosome number across generation (eg human gametes n=23; somatic cells: 2n = 46
* Introduces genetic diversity through crossing over and random assortment.

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* cell division occurs along the equator

3 Anaphase (up)
* In this phase, two chromatids of each chromosome separate.
* Separation occur due to the spliting of the centromere
* The separated chromatids are now called daughter chromosome
* Daughter chromosome move towards opposite pole
* due to contraction of astral rays.

4 Telophase (end)
* This is the last phase of Karyokinesis (in mitosis)
* It is almost the opposite of prophase
* Highly condensed daughter chromosome begin to uncoil and de-condense.
* chromosome start returning to their chromatin state
* Nuclear membrane reforms
* Nucleolus reappear
* Spindle fibre disappear
* Two nuclei are form, one at each pole
* The cell is ready for cytokinesis.

* Cytokinesis.
* It means the division of the cytoplasm
* It start after Anaphase but completed after ~~Ky Ky~~ Karyokinesis.
* Its process is different in plant and animal cells